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ABSTRACT

This paper describes the progress to date of a project to develop an educational environment to train farmers, ranchers, and staff in the use of microcomputers and economic and financial management. The project is located at the Stiles Farm, a 3,300-acre foundation farm in central Texas. A training center has been built at the farm to facilitate educational and demonstration efforts. Between May 1984 and November 1985, seven short (three-day) courses in such computer applications as farm and ranch accounting and beef cattle performance record systems were conducted; farmers who participated rated them very highly. Participants had hands-on use of the computer and a low pupil-teacher ratio. However, the level of attendance at the short courses has been somewhat disappointing, perhaps because the audience for such in-depth courses is relatively limited. The center has also been used as a demonstration and training ground for Extension agents. The center has a microcomputer software library, with software donated by vendors for topical areas where large numbers of programs are available, such as accounting, livestock performance records, and crop record systems. A management information system (MIS) was created for the Stiles Farm and is in the process of being implemented. Further study of the MIS is needed to determine how much integration will be cost efficient. (KC)

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YEAR 2000 COMPUTERIZED FARM PROJECT: CREATING AN EXTENSION MANAGEMENT EDUCATION ENVIRONMENT

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ABSTRACT

This paper describes the progress to date on a project entitled "The Year 2000 Computerized Farm Project". The focus is on the development of an educational environment to train farmers, ranchers and staff in the use of microcomputers and economic and financial management. The management information systems being developed are described, as well as the effects of the system on farm profits.

YEAR 2000 COMPUTERIZED FARM PROJECT: CREATING AN EXTENSION MANAGEMENT EDUCATION ENVIRONMENT

The need for expanding economics and financial management education for farmers, ranchers, educators and agribusinesses to cope in the current economic environment is clearly recognized. Expanded Extension efforts in financial and economic education in the extension service are well documented (Bigwood). This expanded education need is in response to the economic environment but also reflects lack of attention historically to economic and financial training and ineffective educational efforts. The severity of the education deficiency in Texas is described in a paper by VanTassell, Kay and Martin where survey results show 39% of Texas farmers and ranchers did not have adequate training to use basic farm management economic tools. A small portion of county agents and Extension specialists are trained to teach producers to use budgeting and financial analysis and planning tools. Many of the pesticide and other input use recommendations do not address cost issues. Future generations of agricultural producers will necessarily have to be better trained in economics, finance and business management practices to be competitive in agriculture.

A project entitled "Year 2000 Computerized Farm Project" has been under development by the Texas Agricultural Extension Service and the Experiment Station to demonstrate applications of computer technology and to train farmers, ranchers and Extension staff. This project has been supported by grants from the W. K. Kellogg Foundation, Stiles Farm Foundation, Texas Instruments Incorporated, John Deere Corporation and numerous software vendors. The project is located at the Stiles Farm, a 3,300 acres foundation farm in central Texas. A training center has been built at the farm to facilitate education and demonstration efforts.

This paper describes the educational efforts which are taking place at the Stiles Farm through the computer application short courses presented at the Stiles Farm computer training center, microcomputer software library, and the total farm management information system.

Computer Applications Short Courses

Extension farm management specialists are often frustrated by the educational environment presented for teaching producers and staff how to use economic concepts and tools of analysis in decision making. Using computers to facilitate the use of the tools provides a tremendous opportunity but again the short group meetings or mass media methods traditionally used in Extension were inadequate to provide an appropriate educational environment. There is little doubt that many producers in Texas are not adequately trained to use basic farm management economic tools. The traditional educational environment offered by Extension can be at least faulted in part for the limited knowledge many producers have in use of basic economic and financial management tools.

One of the goals of this project was to present an environment where subject matter and computer applications could be taught. This was accomplished by providing short courses of three consecutive days in length on narrow topical areas (e.g. farm and ranch accounting and beef cattle performance record systems). Participants had hands-on use of the computer software (not more than two participants per computer) and a relatively low participant-instructor ratio (not more than 5 to one). Participants are kept together for meals, and have the opportunity to return to the center for evening computer use. Participants paid $145.00 per course which included materials and meals. Extension specialists from the district and state staff served as instructors.

Between May 1984 and November 1985, seven short courses have been held. The largest attendance has been for the short course on farm and ranch accounting and Lotus 1-2-3 applications in agriculture.[1]

Overall evaluation of the courses is exceptionally high, as 85 percent ranked the courses 9 or above on an overall rating scale of 1 to 10. Participants pointed out the value of the in-depth educational effort, the value of the small group approach and extended evening periods, although some participants observed three days is still too short a period. This is likely due to fatigue from the intense training and the inability to absorb more subject matter.

The level of attendance in the short courses has been somewhat disappointing. Several courses were cancelled due to insufficient sign-up. Awareness of the courses being offered takes time, and the audience for such in-depth courses in agriculture is relatively limited. The audience targeted for these courses has high level management skills and the ability to incorporate microcomputer technology into their organization. This is likely not for more than the top 10 to 15 percent of Texas commercial producers. These producers account for 80 percent or more of gross agriculture sales and are a key audience of the land grant institution.

A benefit of the courses is the course materials developed for the training center which can be used in extension programs in other areas of the state. Portable computers are taken out of the center and an increasing number of high schools and community colleges have computer labs that can be used for adult training. Having educational materials available for farm and ranch management courses can encourage local level educational activities.

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[1] Lotus is a trademark of the Lotus Development Corporation.

Education Through Demonstration

During the 1984-85 program year, more than 1,500 farmers, ranchers, agribusinessmen, extension staff members and researchers visited the farm to view the computer applications or participate in training activities. The demonstration of the technology in an on-going commercial farm environment provides an excellent "education through demonstration" environment. This is especially true for technologies such as computers and other electronics, because, in the adoption phase of application, credibility and profitability are somewhat in question.

The center has been a good specialist and county agent training site in that, it is away from campus, has a good software library, and real world applications can be observed.

Software Library

One of the real difficulties faced by farmers and ranchers in developing computerized information is software selection. In most areas of applications, a number of alternative programs are available and vendors and distributors are widely dispersed. To facilitate software review and increase the awareness level of Extension staff, a microcomputer software library has been developed at the training center.

Software was acquired from vendors on request for topical areas where larger numbers of programs are available including: accounting, livestock performance records, and crop record systems. Some firms supplied a full set of the software they sell. All software received was provided to the Texas Agricultural Extension Service in exchange for a tax free gift recognition form. Vendors also supplied lists of distributors and advertisement information to be provided to users of the library.

Participation in this activity by vendors has been exceptional. Approximately $70,000 of agricultural software has been supplied to the project in the first two years. Software has been selected from this activity to use at the farm, and is available to demonstrate to course participants and visitors.

User Group

To broaden the opportunity to develop a farm management information system that has a broader application level, a computer application user group has been formed. This group is composed primarily of commercial agricultural producers, agribusinessmen and lenders in the area where the farm is located. This group will not only learn from the use of the applications at the farm but will also broaden the understanding of the information needs and decision making process of the professionals involved.

The project implementation has really pointed out the importance of the "human component" of the MIS. With a greater indepth participation through the user group, the development and demonstration of the project MIS will be improved and become more flexible in terms of differences in information generation needs of managers.

The Stiles Farm Management Information System

The Stiles Farm is divided roughly into 2,200 acres of cropland and 1,100 acres of pastureland, waterways, ponds, and headquarters. It is located in the Southern Blacklands of Texas, 40 miles northeast of Austin and about 65 miles from the Texas A&M University campus. Diversified production enterprises include cotton, wheat, sorghum, corn, oats, home garden crops, hay, pasture, cow/calf, replacement heifers, farrow-to-finish swine and catfish.

Specialists from the Texas Agricultural Extension Service and the Texas Agricultural Experiment Station assist in planning, implementing, and evaluating crop demonstrations at the farm on a 47-acre piece of land. An advisory committee which represents agricultural producers of the five surrounding counties serves to identify priorities for demonstration work each year. This demonstration work is highlighted in an annual field day attended by more than 1,000 local farmers and ranchers and agribusiness representatives.

From a management standpoint, the foundation has a full time farm manager. A representative of the administrative staff of the College of Agriculture at Texas A&M University also provides input into the major farm management decisions. Prior to the establishment of the project, all accounting work was done by the University accountants.

Being a non-profit institution that is self-financing, the farm does not operate under the same tax and financial information needs as a typical commercial farm. Overall operating goals are similar to a commercial farm with the exception of limited acreage (47 acres) being devoted to crop production technology demonstration.

The stage of the farm in terms of overall change can be characterized much as the life cycle of a typical sole proprietorship. The management and labor force is nearing retirement. The average permanent labor force age is 50 years old and the managerial staff is 54. Where early years in a farming cycle are characterized as growth years with a great deal of change in production technology and enterprises, not much has changed in this area in the past 5 years. In this concentration phase of operation, much less information is required than in the growth or expansion phase.

At the time when the project was initiated there was no formalized management information system (MIS) at the farm. Accounting was done at the University and the manual hog management record system was not adequate for average day-to-day management and evaluation.

Efforts have been made to develop a MIS that does more than meet the limited information used by current management at the Stiles Farm. The system is developed with next generation management in mind, that will likely project the farm into a new growth phase. A well developed information system should facilitate management transition. To have a demonstration value, the system also can generate the type of financial and tax information needed by a typical commercial farm.

The process followed in defining the MIS to be developed was to first define needs in light of both farm goals and education through demonstration goals. At this phase, a university farm management specialist and a private sector farm management consultant were brought in to advise the decision makers on information needs of commercial farmers. After defining information needs, available software was acquired and priority software development requirements were identified. At this stage, data collection and processing issues were addressed.

Figure 1 illustrates the components of the MIS that are under development at the farm. The three major areas of computer applications are the farm accounting, budgeting and problem specific decision aids. These three areas are supported by specific data generating and processing activities at the production enterprise level. Private sector software was chosen from different firms to fit the farm situation and perceived information generation needs. Other software came from on-going software development efforts at Texas A&M University such as the "Microcomputer Budget Management System", a

budget generator program. Software developed specifically as a result of the project are in the areas of forage productivity for cattle management, a data collection system for labor and machinery use, and machinery management software. Mississippi State University was contracted to modify software to meet the catfish record system software needs.

One of the limitations of putting different software packages together from different sources is that they are not truly "integrated" in the sense that data entry duplication is eliminated. The accounting package is programmed into a data base management system so modules are being developed to add into the system and the crop field record is an integrated part of the enterprise accounting.

Truly integrated information systems for farms of this complexity are potentially feasible but more must be known about information needs and the decision making process before the cost of integrating can be justified.

Working with different vendors in developing the system has been beneficial to both parties involved. There has been a two-way exchange of information, and errors and limitations of software were communicated to vendors who, in turn, modified programs and used the project to test their programs.

Staff involved also gained a deeper appreciation of the frustration experienced by farmers and ranchers in using available software. MIS development is a dynamic process and will change as technology changes, as the human component changes, and as we have a better understanding of the decision making process.

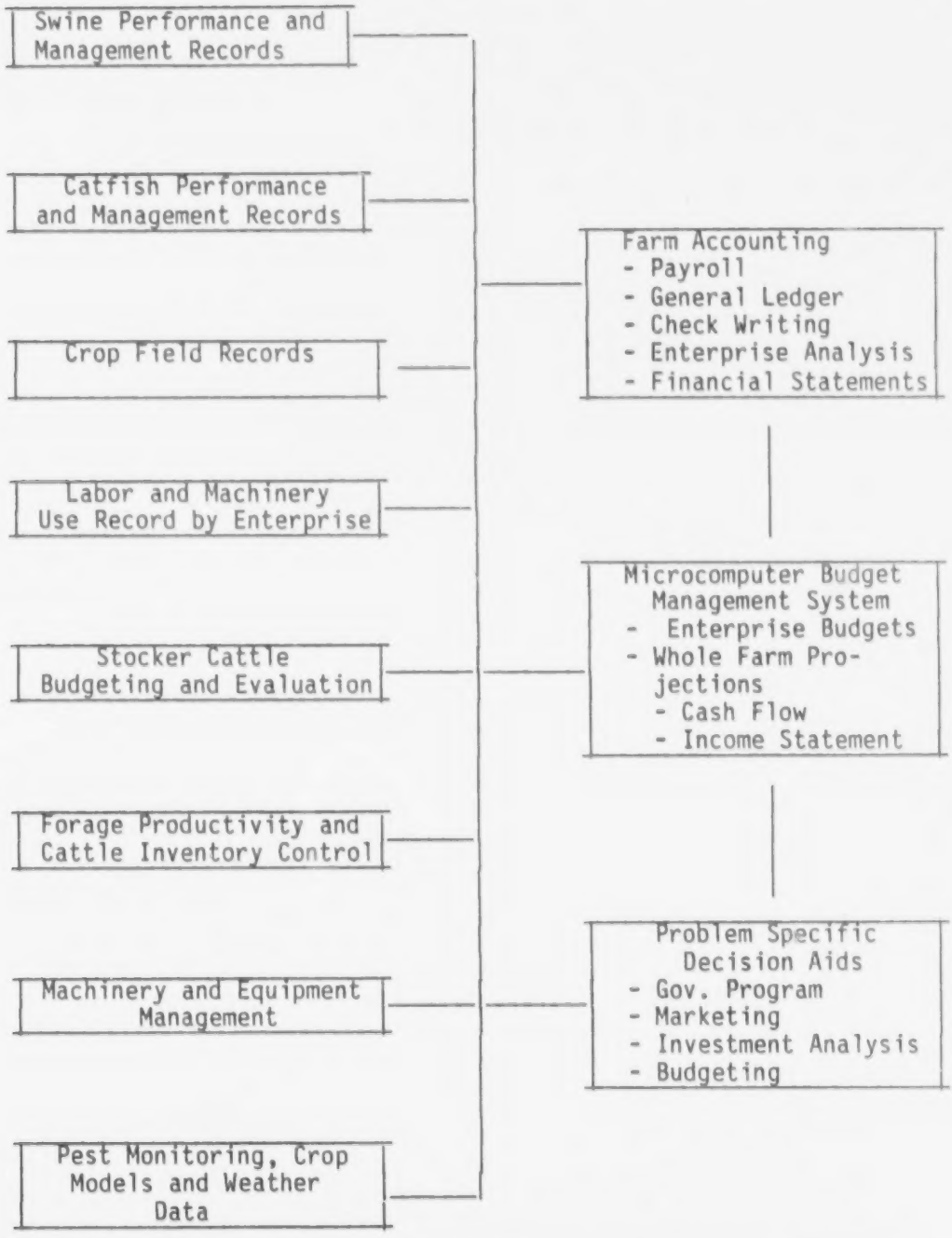

FIGURE 1. STILES FARM COMPUTERIZED INFORMATION SYSTEM COMPONENTS

Electronic Data Generation and Transfer

One of the limitations of farm information systems is the human effort and cost associated with data collection and transfer into the computer for processing. Several applications of electronic technology for this activity are being developed and tested at this farm. These include (1) an electronic weather station that stores data and automatically transfers the data to the farm computer every 24 hours, (2) data logger use as a substitute for the hand-written data collection, (3) infrared data transmitters for the swine record system, (4) electronic collection of pest counts, primarily for use in insect control for cotton, and (5) a computer monitored tractor. All these technologies are installed at the farm, but it is too early to provide information as to their potential for having profitable application in data generation and transfer on commercial farms. The final year of the project will focus on evaluating these technologies and integrating them into the MIS.

Contribution of System of Farm Profits

The economic value of a MIS to a farm can be measured in terms of how the decisions made as a result of the information lead to more profitable decisions, or reduce loss by prevention of errors or choice of less profitable options. It is extremely difficult to quantify the value of information in farm management. The situation at the project farm is more challenging to evaluate than many farms. First the system was imposed on the management, which naturally creates more resistance and an attitude that the system was not needed. The non-profit tax status and financial condition of the farm makes this information have little or no real value to the farm. Thus the potential for profitability deals with cost control, production management and choice of enterprise combination. With the scale and the complexity of the farm, profitable opportunities are being identified, although the system has

not been in operation long enough nor has a sufficient bench mark data base existed for comparative analysis.

The enterprise budgeting and initialization of the enterprise accounting and decision aids have generated an increased awareness of costs and profitability of different courses of action. The ability to more quickly show economic results has lifted the level of awareness and more questions are raised as a result of information. Having the accounting and payroll monthly reports has allowed the generation of forward planning budgets. The hog management package resulted in a more efficient culling program in the swine enterprise. Budgeting of actual enterprises has reinforced the necessity to implement certain management practices and uncovered some mistakes being made. This higher level of awareness of "what is going on" is hard to express in dollar terms but is significant at the Stiles Farm as it is on most commercial farms that have good information systems. It is also evident that the information and data base being developed will be important for directing activities when the "new generation of management" starts the farm in a new growth phase of development.

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